

REMARKS

By the present Amendment, Applicant has amended Claims 1-2. Claims 1-32 are pending in the application. Claims 9-32 have been allowed, so the sole remaining issue is independent Claim 1 and Claims 2-8 dependent therefrom.

The Office Action has been carefully reviewed, and these amendments and arguments are made in a genuine effort to bring the application into condition for allowance. Reconsideration of the rejection of Claims 1-8, and allowance of these claims, is respectfully requested in light of these amendments and arguments.

The Present Invention

The present invention provides an air or gas-powered gun providing a recoil that is enhanced over that of a typical air or gas-powered gun, and is substantially that of a firearm or gun firing a powder propelled projectile. The level of recoil generated is therefore significantly more than would normally be provided through the equal and opposite reaction to the action of the discharge of a pellet, and will require the shooter to reacquire the target when looking through the sight after each shot, unlike a typical air gun. Furthermore, the level of recoil generated will be sufficient to get a shooter accustomed to the recoil of a powder-propelled firearm. This feature provides a gas-powered gun that may be utilized as a training alternative to an actual firearm, that may be used safely in a wider variety of locations and training exercises than an actual firearm, and that is significantly less expensive to shoot than an actual firearm.

The Cited Art

U.S. Patent No. 4,116,193 (Chiba) describes a manually operated, pressurized gas gun. This air gun includes a tubular magazine having a spring-biased follower, with the front of the magazine being positioned against a horizontally moving carrier. The carrier defines a hole for receiving a single pellet, and reciprocates between a position wherein the hole is aligned with the magazine, and a second position wherein the hole is aligned with the bore. A bolt reciprocates between a rearward position permitting horizontal movement of the carrier, and a forward position wherein a pellet picked up by the carrier and aligned with the bore has been pushed forward ahead of the bolt into a chamber. Movement of the bolt and carrier are controlled by a reciprocating operating handle in the form of a forestock. Air from a gas cartridge is permitted to enter a valve chamber until air pressure within the valve chamber is sufficient to overcome the force of the spring holding the valve chamber open, at which point the air pressure closes the valve chamber. When the trigger is pulled, the

trigger movement causes a sear to release a hammer, striking the rear portion of a valve rod, opening the valve and permitting the gas therein to expand behind the pellet in the chamber, driving the pellet out of the barrel. Once the pellet is discharged from the barrel, it is necessary to cycle the operating handle to chamber the next pellet from the magazine. As the Examiner correctly notes, every action has an equal and opposite reaction, which would cause the air gun of Chiba to exhibit a very small, virtually imperceptible recoil. There is no mechanism whatsoever disclosed within Chiba for increasing the small, virtually imperceptible recoil up to the substantially larger level of recoil exhibited by a powder propelled firearm.

U.S. Patent No. 4,819,609 (Tippmann) discloses a valve assembly and a firing mechanism including a spring-biased bolt. The bolt is held in its rearward position, against the spring pressure, by the trigger mechanism. The valve assembly includes a tubular valve housing having a valve at each end, with the valves being spring-biased away from each other and towards each end of the valve housing, so that the spring pressure biases each valve against the valve housing, closing the valve. Both the valve housing and the rear valve are reciprocable between a forward and a rearward position. When the trigger is pulled and both released, the bolt travels forward to strike the valve assembly, causing both the rear valve and tubular housing to move forward, thereby opening both the forward and the rear valves within the assembly. Compressed gas escaping through the forward valve pushes the projectile out the barrel. Compressed gas escaping through the rear valve pushes the bolt back to its original position against the forward bias of the bolt spring. A selector switch moves the sear pivot pin between three positions: a safe position, wherein the trigger cannot reach the sear to trip it; a semi-automatic position, wherein the trigger may trip the sear, but the sear slips past the end of the trigger when the trigger is fully retracted; and full automatic, wherein the trigger holds the sear out of engagement with the bolt for the duration of the trigger pull. As the Examiner correctly notes, the action of discharging a paint pellet from the paint ball gun of Tippmann would create an equal and opposite reaction. Tippmann does not disclose any means for increasing this barely perceptible reaction to the action of firing a pellet to the substantially greater level of recoil generated by a powder propelled firearm, or even the desirability of doing so.

Allowable Subject Matter

Applicant notes with appreciation that the Examiner has indicated that Claims 9-32 are allowed.

Rejection of Claim 1 Under 35 U.S.C. § 112

The Examiner rejected Claim 1 under 35 U.S.C. § 112, second paragraph, stating that the term “approximate” renders the claim indefinite. Applicant has amended Claim 1 to clarify through substitution of the term, “substantially,” that the recoil is enhanced to substantially the level of recoil generated by a gun firing a powder propelled projectile. These are alternate ways of expressing the advantageous feature of the invention.

As explained by the specification at pages 1-2, the present invention is designed to duplicate the recoil of a conventional firearm sufficiently closely so that a trainee firing an airgun of the present invention will become accustomed to the recoil generated by a conventional firearm. Additionally, the recoil should be sufficiently close to that of a firearm so that a trainee firing a full automatic air gun of the present invention will be able to properly learn how to control a full automatic weapon. Furthermore, as explained by the Declarations of Mark Schavone and John McGovern, the recoil of a conventional firearm will force a shooter to reacquire the target while looking through the sights after each shot, while a typical air gun will not. These characteristics of recoil will be readily recognized by anyone skilled in the art of shooting.

Therefore, Claim 1, as amended, is sufficiently definite so that one skilled in the art of shooting will understand its scope and limitations.

Rejection of Claim 1 Under 35 U.S.C. § 102(b)

The Examiner rejected Claim 1 under 35 U.S.C. § 102(b) as being anticipated by both Tippmann and Chiba. The Examiner based this rejection on the idea that all guns generate a recoil due to Newton’s Third Law, and the Examiner’s opinion that Claim 1 does not clearly define the degree of a recoil that must be generated by an air gun before the claim reads on that air gun.

Although Tippmann and Chiba both exhibit a recoil from the action of expelling a projectile a high velocity in one direction, resulting in momentum of the gun in the other direction, this recoil does not result in any felt recoil, and is completely imperceptible to a shooter. This recoil will not come anywhere near approaching the recoil generated by a gun firing powder propelled projectiles.

Furthermore, this recoil will not be anything near sufficient to get a shooter accustomed to the recoil of a conventional firearm. Additionally, the recoil generated by Tippmann and Chiba will be insufficient to force a shooter to reacquire the target while looking through the sight after each shot. This recoil will also be insufficient to acquaint a shooter with controlling a full automatic weapon.

As shown by the Declarations of Mark Schavone and John McGovern, the recoil generated by an air gun of the present invention is sufficient to force a shooter to reacquire the sights after each shot, like a conventional firearm. Furthermore, Mark Schavone has calculated the recoil of one preferred embodiment of the airgun of the present invention to be about four to five ft.-lbs. when set up for light recoil, and nine ft.-lbs. when set up for heavy recoil. By comparison, the recoil of a conventional M16 rifle is 5-7 ft.-lbs. with some of the better muzzle brakes that are presently available, and 13 ft.-lbs. without a muzzle brake. Other embodiments of the airgun can be set up for other levels of felt recoil. For example, if compromising the cyclic rate and gas consumption rate is acceptable for the desired application, as much as 23 ft.-lbs. of recoil can be generated, approximating the about 25 ft.-lbs. of recoil generated by a typical 12 gauge shotgun. The recoil of the air gun is therefore at about the level of the recoil of a conventional firearm because it is sufficiently close to the recoil of a conventional firearm to get a shooter accustomed to the recoil of a conventional firearm, and to force the shooter to reacquire the target while looking through the sights between shots.

Therefore, Applicant submits that neither Tippmann nor Chiba teach or suggest an air gun having a level of recoil of about that of a conventional firearm. Applicant therefore respectfully requests reconsideration of this rejection and allowance of Claim 1.

Rejection of Claims 2-5 and 7-8 Under 35 U.S.C. § 102

The Examiner rejected Claims 2-5 and 7-8 under 35 U.S.C. § 102 as being anticipated by Tippmann.

Claim 2 is dependent from Claim 1, and therefore includes the limitation that a gas powered gun comprises a means for simulating a recoil that is enhanced to substantially the level of the recoil generated by a gun firing a powder propelled projectile. As explained above, any recoil generated by Tippmann is the incidental result of Newton's Third Law, and the likewise incidental result of the reciprocating bolt mass. There is no teaching or suggestion within Tippmann to enhance the recoil

of a gas powered gun to about the substantially heavier level of recoil generated by a gun firing a powder propelled projectile. Furthermore, Tippmann will not generate a sufficient recoil to get a shooter accustomed to the recoil of a conventional firearm, or to force the shooter to reacquire the target while looking through the sights between shots.

Furthermore, Claim 5 recites that the spring, forward valve, and rear valve form a captive assembly. A captive assembly provides the advantage of ease of repair and replacement, and is neither taught nor suggested by Tippmann.

Claims 7 and 8 are both directed towards a buffer assembly. Claim 7 recites that the buffer assembly biases the bolt towards its forward position, and provides a recoil for the shooter. Claim 8 further recites that the buffer assembly includes a spring-biased air-resistant bolt driver. Use of both the bolt and the buffer assembly to provide recoil to a shooter permits the level of recoil to be varied to simulate the many different levels of recoil generated by a wide variety of powder-propelled firearms. For example, by using the air resistance bolt driver recited in Claim 8, the recoil of a small caliber powder propelled projectile.

Therefore, Claims 2-5 and 7-8 are submitted to be in condition for allowance.

Rejection of Claim 6 Under 35 U.S.C. § 103

Claim 6 was rejected under 35 U.S.C. § 103(a) as being obvious in light of Tippmann in view of ordinary skill in the art. The Examiner asserts that there is no disclosed criticality of the floating mass. Applicant respectfully disagrees.

As explained on page 2, it is important that the present invention simulate both the recoil and the cyclic rate of a full automatic firearm to be useful to train a shooter to use a full automatic firearm. As explained on page 18, lines 8-13, the floating mass within the bolt provides a means of varying the cyclic rate of full automatic fire by slowing forward bolt travel sufficiently so that the sear may momentarily catch and delay forward movement of the bolt. Furthermore, page 8, lines 2-6, explain that it is the reciprocating mass that supplies a recoil to a shooter. The reciprocating mass includes both the reciprocating bolts with the mass therein, and the reciprocating bolt driver.

Therefore, reconsideration of this rejection and allowance of Claim 6 is respectfully requested.

CONCLUSION

For the above reasons, it is respectfully submitted that Claims 1-8 are now in condition for allowance. If such is not the case, the Examiner is invited to telephone Applicant's representative so that any additional issues may be resolved.

Respectfully submitted,

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